

PATENT

Attorney Docket No. 22700-704

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application)	<u>PATENT APPLICATION</u>
Inventor(s): Santasiero et al.)	
Application No.: Not Yet Assigned)	Art Unit: Not Yet Assigned
Filed: Herewith)	Examiner: Not Yet Assigned
Title METHOD FOR SCREENING)	
MICROCRYSTALLIZATIONS FOR)	
<u>CRYSTAL FORMATION</u>)	



INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. §1.97

Commissioner for Patents
Washington, D.C. 20231

Sir:

Listed below or on an attached Form PTO-1449 is information known to applicant(s). A copy of each listed publication and U.S. and foreign patent, except for pending U.S. applications, can be found in prior U.S. Patent Application No.: 09/851,397: May 7, 2001, along with a concise explanation of information in a foreign language, if any, pursuant to 37 C.F.R. §1.97-1.98.

1.98(d) A copy of any patent, publication or other information listed in an information disclosure statement is not required to be provided if it was previously cited by or submitted to the office in a prior application, provided that the prior application is properly identified in the statement and relied upon for an earlier filing date under 35 U.S.C. 120.

Applicants respectfully request that the listed information be considered by the Examiner and be made of record in the above-identified application. If form PTO-1449 is enclosed, the Examiner is requested to initial and return it in accordance with MPEP §609.

This statement is not intended to represent that a search has been made or that the information cited in the statement is, or is considered to be, material to patentability as defined in §1.56.

☒ This statement qualifies under 37 C.F.R. §1.97, subsection (b) because (check all that apply):

☒ (1) It is being filed within 3 months of the application filing date and is other than a continued prosecution application under § 1.53(d)

-- OR --

☐ (2) It is being filed within 3 months of entry of a national stage

-- OR --

☐ (3) It is being filed before the mail date of the first Office Action on the merits

-- OR --

☐ (4) It is being filed before the mailing of a first Office Action after the filing of a request for continued examination under § 1.114.

☐ 37 C.F.R. §1.97(c). If this statement is being filed after the latest of: (1) three months beyond the filing date of a national application; (2) three months beyond the date of entry of the national stage as set forth in §1.491 in an international application; or (3) the mailing date of a first Office action on the merits, but before the mailing date of the earlier of a final office action under §1.113 or a notice of allowance under §1.311, then:

☐ a certification as specified in §1.97(e) is provided below; or

☐ a fee of \$180.00 as set forth in §1.17(p) is authorized below, enclosed, or included with the payment of other papers filed together with this statement.

☐ 37 C.F.R. §1.97(d). If this statement is being filed after the mailing date of the earlier of a final office action under §1.113 or a notice of allowance under §1.311, but before payment of the issue fee, then:

A. a certification as specified in §1.97(e) is completed below; and

B. a petition under 37 C.F.R. §1.97(d) requesting consideration of this statement is submitted herewith; and

C. a fee of \$130.00 as set forth in §1.17(i)(1) is authorized below, enclosed, or included with the payment of other papers filed together with this statement.

☒ *Fee Authorization.* The Commissioner is hereby authorized to charge the above-referenced fees of \$0.00 and charge any additional fees or credit any overpayment associated with this communication to Deposit Account No. 23-2415 (Docket No. 22700-730).

Respectfully submitted,

WILSON SONSINI GOODRICH & ROSATI

Dated: Dec 21, 2001

By: David J. Weitz
David J. Weitz, Reg. No. 38,362

650 Page Mill Road
Palo Alto, CA 94304-1505
(650)493-9300
Customer No. 021971

INFORMATION DISCLOSURE CITATION PTO-1449		ATTY. DOCKET NO. 22700-730		SERIAL NO. Not Yet Assigned	
		APPLICANT Santasiero et al.			
		FILING DATE 12/21/01		GROUP Unassigned	

Jc826 U.S. PTO
10/026362
 12/21/01

U.S. PATENT DOCUMENTS						
EXAMINER'S INITIALS	PATENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE
	4,833,233	5-23-89	Carter	530	363	8-20-87
	6,057,159	5-2-00	Lepre	436	86	12-12-97
	4,263,010	4-21-81	Randolph	23	230 A	10-31-79
	4,668,584	5-26-87	Uzgiris et al.	428	408	12-23-85
	4,755,363	7-5-88	Fujita et al.	422	245	10-29-86
	4,886,646	12-12-89	Carter et al.	422	245	3-23-88
	4,919,899	4-24-90	Herrmann et al.	422	245	2-29-88
	5,078,975	1-7-92	Rhodes et al.	422	253	12-18-90
	5,096,676	3-17-92	McPherson et al.	422	245	8-2-90
	5,419,278	5-30-95	Carter	117	206	5-25-94
	5,641,681	6-24-97	Carter	436	4	4-17-95
	5,643,540	7-1-97	Carter et al.	422	245.1	2-27-95
	5,872,010	2-16-99	Karger et al.	436	173	7-3-96
	5,096,676	3-17-92	McPherson et al.	422	245	8-2-90
	5,221,410	6-22-93	Kushner et al.	156	600	10-9-91
	5,873,394	2-23-99	Meltzer	141	130	9-18-97
	6,039,804	3-00	Kim et al.	117	206	

FOREIGN PATENT DOCUMENTS							
EXAMINER'S INITIALS	PATENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
	WO 00/60345	12/10/00	PCT	G01N	31/00	<input type="checkbox"/>	<input type="checkbox"/>
	0 553 539 A1	04/08/93	Europe	C30B	7/00	<input type="checkbox"/>	<input type="checkbox"/>

EXAMINER	DATE CONSIDERED
-----------------	------------------------

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

INFORMATION DISCLOSURE CITATION PTO-1449	ATTY. DOCKET NO. 22700-730	SERIAL NO. Not Yet Assigned
	APPLICANT Santasiero et al.	
	FILING DATE 12/21/01	GROUP Unassigned
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)		
	Stewart, P.D.S. et al., "Practical Experimental Design Techniques for Automatic and Manual Protein Crystallization" J CRYSTAL GROWTH 196, pp. 665-673	
	Baldock, P. et al., "A Comparison of Microbatch And Vapor Diffusion For Initial Screening of Crystallization Conditions" J. CRYSTAL GROWTH 168; pp. 170-174	
	Cudney, B. et al., "Screening and Optimization Strategies For Macromolecular Crystal Growth", ACTA CRYSTALLOGR D50, pp. 414-423	
	McPherson, A., "Two Approaches to the Rapid Screening of Crystallization Conditions" J CRYSTAL GROWTH 122; pp. 161-167	
	Ward, K.B. et al., "Automating Crystallization Experiments. In: Crystallization of Nucleic Acids and Proteins: a Practical Approach" eds. A. Ducruix & R. Giege, Oxford University Press, New York; pp. 291-310.	
	Weber, P.C., "Overview of Protein Crystallization Methods" METHODS ENZYMOL, 276, pp. 13-22 (1997)	
	McPherson, A. "Crystallization of Biological Macromolecules" COLD SPRING HARBOR LABORATORY PRESS; (1999)	
	McPherson, A. "Crystallization of Macromolecules: general principals" METHODS ENZYMOL, 114; pp. 112-120 (1985)	
	McPherson, A. "Use of Polyethylene Glycol in the Crystallization of Macromolecules" METHODS ENZYMOL; 114; pp. 120-125 (1985)	
	McPherson, A. "Crystallization of Proteins by Variation of pH or Temperature", METHODS ENZYMOL, 114; pp. 125-127	
	Jancarik, J. et al., "Sparse Matrix Sampling: A Screening Method For Crystallization of Proteins", J. APPL. CRYST. 24; pp. 409-411 (1991)	
EXAMINER		
DATE CONSIDERED		

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

INFORMATION DISCLOSURE CITATION PTO-1449	ATTY. DOCKET NO. 22700-730	SERIAL NO. Not Yet Assigned
	APPLICANT Santasiero et al.	
	FILING DATE 12/21/01	GROUP Unassigned
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)		
	Gilliland , G.L. et al., "Biological Macromolecule Crystallization Database, Version 3.0: New Features, Data and the NASA Archive for Protein Crystal Growth Data" ACTA CRYSTALLOGR. D50; pp. 408-413 (1994)	
	Perrakis, A et al., "Protein Microcrystals and the Design of a Micro-Diffractometer: Current Experience and Plans at EMBL and ESRF/ID13; ACTA CRYSTALLOGR D55; pp. 1765-1770 (1999)	
	Pebay-Peyroula, R. et al., "X-ray Structure of Bacteriorhodopsin at 2.5 Angstroms from Microcrystals Grown Lipidic Cubic Phases" SCIENCE 277; pp. 1676-1681	
	Sibille, L., Clunie, J.C., Baird, J.K. Solvent evaporation rates in the closed capillary vapor diffusion method of protein crystal growth. <i>J. Cryst. Growth</i> 110, 80-88 (1991).	
	Montelione, G, Anderson, S: Structural genomics: keystone for a human proteome project. <i>Nature Struct Biol</i> (1999) 6(1):11--12.	
	Burley, SK, Almo, SC, Bonanno, JB, Capel, M, Chance, MR, Gaasterland, T, Lin, D, Sali, A, Studier, FW, Swaminathan, S: Structural genomics: beyond the Human Genome Project. <i>Nature Genet</i> (1999) 23:151--157.	
	Gaasterland, T: Structural genomics: Bioinformatics in the driver's seat. <i>Nature Biotechnol</i> (1998) 16:625-627.	
	Rost, B: Marrying structure and genomics. <i>Structure</i> (1998) 6:259--263.	
	Shapiro, L, Lima, CD: The Argonne Structural Genomics Workshop: Lamaze class for the birth of a new science. <i>Structure</i> (1998) 6:265--267.	
	Ducruix, A, Giege, R (Eds): <i>Crystallization of nucleic acids and proteins. A practical approach. Second edition.</i> Oxford: Oxford University Press; (1999).	
	D-Arcy, A: Crystallizing proteins - a rational approach? <i>Acta Crystallogr D</i> (1994) 50:469--471.	
	Stura, EA, Satterthwait, AC, Calvo, JC, Kaslow, DC, Wilson, IA: Reverse screening. <i>Acta Crystallogr D</i> (1994) 50:448--455.	
	Hampton Research Homepage on World Wide Web at URL: http://www.hamptonresearch.com	
	Emerald BioStructures Homepage on World Wide Web at URL: http://www.emeraldbiostructures.com	
	Carter, C, Jr: Efficient factorial designs and the analysis of macromolecular crystal growth conditions. <i>Methods</i> (1990) 1(1):12--24	
	Carter, C, Jr: Design of crystallization experiments and protocols. <i>Crystallization of nucleic acids and proteins. A practical approach.</i> Ducruix, A, Giege, R, (Eds): New York: IRL Press; (1992):47--71	
EXAMINER		DATE CONSIDERED

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

INFORMATION DISCLOSURE CITATION PTO-1449	ATTY. DOCKET NO. 22700-730	SERIAL NO. Not Yet Assigned
	APPLICANT Santasiero et al.	
	FILING DATE 12/21/01	GROUP Unassigned
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)		
	Jones, N, Swartzendruber, JK, Deeter, JB, Landis, ND, Clawson, DK: Apocalypse now: update on automated protein crystallization using the new ACA vapor diffusion plate. <i>Acta Crystallogr A</i> (1987) 43(Supplement): C275.	
	Douglas Instruments Homepage on World Wide Web at URL: http://www.douglas.co.uk/home.htm A good introduction to the application of the microbatch technique for high-throughput work is available at the Web Site of Douglas Instruments [URL: http://www.douglas.co.uk/proposal.htm - The use of microbatch for large scale crystallization projects].	
	Cyberlabs Homepage on World Wide Web at URL: http://www.gilson.com/cyberprd.htm First commercially available robotics system for protein crystal growth. The Cyberlabs instrument has undergone revisions over the years. They are now addressing the need to create imaging stations for protein crystal analysis.	
	Baird, JK: Theory of protein crystal nucleation and growth controlled by solvent evaporation. <i>J Cryst Growth</i> (1999) 204:553--562	
	Bullock, E. and E.C. Pyatt, Apparatus for the growth of crystals from small volumes of solution, in <i>J. Phys.</i> E. 1972. 412-13.	
	Luft, J.R., D.M. Rak, and G.T. DeTitta, Microbatch macromolecular crystallization in micropipettes, in <i>J. Cryst. Growth</i> . 1999. 450-455.	
	Pusey, M. and R. Naumann, Growth kinetics of tetragonal lysozyme crystals, in <i>J. Cryst. Growth</i> . 1986. 593-9.	
	Reshetnyak, I.I., Effect of ultrasound on crystallization kinetics in small volumes of solutions, in <i>Akust. Zh.</i> 1975. 99-103.	
	Rippon, G.D., A. Patak, and A.T. Marshall, Improved microdroplet method for quantitative x-ray microanalysis of small fluid samples, in <i>Micron</i> . 1993. 17-21.	
	Tebbutt, J.S., T. Marshall, and R.E. Challis, Monitoring of crystallization phenomena by ultrasound, in <i>Electron. Lett.</i> 1999. 90-91.	
	Zeppezauer, M., H. Eklund, and E.S. Zeppezauer, Micro diffusion cells for the growth of single protein crystals by means of equilibrium dialysis, in <i>Arch. Biochem. Biophys.</i> 1968. 564-73.	
	Chayen, N.E., Shaw Stewart, P.D., Blow, D.M.: Microbatch crystallization under oil - a new technique allowing many small-volume crystallization trials. <i>J Crystal Growth</i> (1992) 122:176-180.	
	Chayen, N.E., Shaw Stewart, P.D. , Baldock, P.: New developments of the IMPAX small-volume automated crystallization system. <i>Acta Cryst</i> (1994) D50:456-458.	
	Wilson, S.A., et al.: Crystallization of and preliminary X-ray data for the negative regulator (AmiC) of the amidase operon of <i>Pseudomonas aeruginosa</i> . <i>J Mol Biol</i> (1991), 222: 869-871.	
	Varadarajan, R. and F.M. Richards: Crystallographic structures of ribonuclease S variants with nonpolar substitution at position 13: packing and cavities. <i>Biochemistry</i> (1992), 31: 12315-12327.	
EXAMINER		DATE CONSIDERED

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

INFORMATION DISCLOSURE CITATION PTO-1449	ATTY. DOCKET NO. 22700-730	SERIAL NO. Not Yet Assigned
	APPLICANT Santasiero et al.	
	FILING DATE 12/21/01	GROUP Unassigned
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)		
	Rawas, A., et al.: Preliminary crystallographic studies on duck ovotransferrin. J Mol Biol (1989), 208: 213-214.	
	Evans, P.R., G.W. Farrants, and M.C. Lawrence: Crystallographic structure of allosterically inhibited phosphofructokinase at 7 A resolution. J Mol Biol (1986), 191: 713-720.	
	Rubin, B., Talafous, J., Larson, D.: Minimal intervention robotic protein crystallization. J. Cryst Growth (1991) 110:156-163	
	Kelders, H.A., et al.: Automated protein crystallization and a new crystal form of a subtilisin:eglin complex. Protein Eng (1987), 1: 301-3.	
	Oldfield, T.J., Ceska, T.A., Brady, R.L. A flexible approach to automated protein crystallization. J Appl Cryst (1991) 24:255-260.	
	Andersen, G.R., Nyborg, J. A spreadsheet approach to automated protein crystallization. J Appl Cryst (1996) 29:236-240.	
	Morris, D.W., Kim, C.Y., McPherson, A. Automation of protein crystallization trials: use of a robot to deliver reagents to a novel multi-chamber vapor diffusion plate. Biotechniques (1989) 7:522-527.	
	Swartzendruber, J.K., Jones, N.D. APOCALYPSE: an automated protein crystallization system. III. In the beginning: The genesis of software. (1988) p.81 Annual Meeting of the American Crystallographic Association, Philadelphia, PA.	
	Weber, P.C., Cox, M.J. Experiments with automated protein crystal growth. (1987) p.28 Annual Meeting of the American Crystallographic Association, Philadelphia, PA.	
	Brodersen, D. E., Jenner, L. B., Andersen, G. R. and Nyborg, J. (1999). XAct: a program for construction, automated setup and bookkeeping of crystallization experiments. J. Appl. Crystallogr. 32: 1012-16	
	Zeelen, J. Ph.; Hiltunen, J. K.; Ceska, T. A.; Wierenga, R. K. (1994) Crystallization experiments with 2-enoyl-CoA hydratase, using an automated 'fast-screening' crystallization protocol. Acta Crystallogr. D50: 443-447	
	Diller, D.J., Hol, W.G.J. An accurate numerical model for calculating the equilibration rate of a hanging-drop experiment. Acta Crystallogr. D55, 656-663 (1999).	
	Pusey, M.L. et al., "Protein Crystal Growth" GROWTH KINETICS FOR TETRAGONAL LYSOZYME CRYSTALS, 261; pp. 6524-6529	
	Cox, M. J. et al., "An Investigation of Protein Crystallization Parameters Using Successive Automated Grid Searches (SAGS)", <i>Journal of Crystal Growth</i> , Vol. 90, Nos. 1-3, July 1988, pp. 318-324.	
	Chayen, N. et al., "An Automated System for Micro-Batch Protein Crystallization and Screening", <i>J. Appl. Cryst.</i> , Vol. 23 (1990), pp. 297-302.	
EXAMINER	DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

INFORMATION DISCLOSURE CITATION PTO-1449	ATTY. DOCKET NO. 22700-730	SERIAL NO. Not Yet Assigned
	APPLICANT Santasiero et al.	
	FILING DATE 12/21/01	GROUP Unassigned
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)		
	Tisone, T., "Dispensing systems for miniaturized diagnostics", <i>IVD Technology Magazine</i> (Online), May 1998, 9 pages.	
	Berry, M. B., "Protein Crystallization: Theory and Practice", <i>Structure and Dynamics of E. Coli Adenylate Kinase</i> ; Thesis, Rice University, Houston, TX, (Online) (1995), 13 pages.	
	Yakovlev, Y. et al., "A Laboratory Apparatus for Crystal Growth from Solution", <i>Instruments and Experimental Techniques</i> , Vol. 41, No. 2 (1998), pp. 157-161.	
	Casay, G. et al., "Laser scattering in a hanging drop vapor diffusion apparatus for protein crystal growth in a microgravity environment", <i>Journal of Crystal Growth</i> , Vol. 122 (1992), pp. 95-101.	
	Gonzalez, F. et al., "Crocodile: An Automated Apparatus For Organic Crystal Growth From Solution", <i>Acta Astronautica</i> , Vol. 25, No. 12 (1991), pp. 775-784.	
	Beckmann, W. et al., "The Effect Of Additives on Nucleation: A Low Cost Automated Apparatus", <i>Journal of Crystal Growth</i> , Vol. 99 (1990), pp. 1061-1064.	
	Leonidas, D. et al., "Refined Crystal Structures of Native Human Angiogenin and Two Active Site Variants: Implications for the Unique Functional Properties of an Enzyme Involved in Neovascularisation During Tumour Growth", <i>J. Mol. Biol.</i> , Vol. 285 (1999), pp. 1209-1233.	
	Cox, M. J. et al., "Experiments with Automated Protein Crystallization", <i>J. Appl. Cryst.</i> , Vol. 20 (1987), pp. 366-373.	
	Ward, K.B. et al., "Automatic Preparation of Protein Crystals Using Laboratory Robotics and Automated Visual Inspection", <i>Journal of Crystal Growth</i> , Vol. 90 (1988), pp. 325-339.	
	Soriano, T. et al., "ASTEC: an Automated System for Sitting-Drop Protein Crystallization", <i>J. Appl. Cryst.</i> , Vol. 26 (1993), pp. 558-562.	
	Newman, A., "Send in the Robots", <i>Analytical Chemistry</i> , Vol. 62, No. 1, January 1, 1990, pp. 29A-34A.	
	"Automatic Protein Crystallization System", (Advertising Supplement), Douglas Instruments Ltd., London, (1990), 4 pages.	
	Stevens, R.C. et al., Research Proposal for development and testing of a system of robotics workstations dedicated to protein crystallization. E.O. Lawrence Berkeley National Laboratory and The Scripps Research Institute, pp. 2, 29-52 (Rev. May 1995).	
	Sali, A., "100,000 protein structures for the biologist", printed April 1, 1999 from world wide web site http://guitar.rockefeller.edu/avalon/review/avalon.html , 7 pages.	
	"Functional Genomics", printed April 1, 1999 from world wide web site http://www.bmb.psu.edu/simpson/16genome/Function.htm , 1 page.	
	Gaasterland, T., "The Role of Computational Biology In High-Throughput Structure Determination: Computation Before, During, and After Structural Genomics", printed April 1, 1999 from world wide web site http://www-fq.mcs.anl.gov/~gaasterland/sg-review-slides.html , 14 pages.	
	"Crystallization Research Tools", Vol. 9, No. 1 (1999), Hampton Research Corp., Laguna Niguel, CA., 63 pgs	
EXAMINER		DATE CONSIDERED

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.